

5 **DEVICE AND METHOD FOR CONDUCTING CELLULAR ASSAYS**
 USING MULTIPLE FLUID FLOW

10 **ABSTRACT OF THE DISCLOSURE**

 The invention relates to a device for exposing a substrate surface to at least one
fluid. The device comprises a substrate having a surface containing a contiguous target
region and a cover plate. A plurality of fluid-transporting features is present in a cover
plate surface, and the features are separated by at least one partitioning wall representing
15 an integral portion of the cover plate. The features fluidly communicate with at least one
outlet, and each feature fluidly communicates with an inlet. The cover plate surface is
positioned in fluid-tight contact with the substrate surface such that the at least one
partitioning wall contacts the contiguous target region. As a result, each feature, in
combination with the substrate surface, forms a flow passage containing a distinct
20 exposure zone on the target region. Also provided are methods for exposing a substrate
surface to a plurality of cells and methods for detecting cell-cell interactions.